

ABSTRACT

Agents for enhancing the contrast in a diagnostic ultrasound procedure comprise colloidal dispersions of the liquid-in-liquid type, i.e., emulsions or microemulsions, in which the dispersed liquid phase is a liquid having a boiling point below the temperature of the animal to be imaged and which therefore undergoes a phase change from a dispersed liquid to a highly echogenic dispersed gaseous foam or kugelschaum following administration to the animal. The liquid state of the dispersed phase allows one to manufacture extremely stable, pharmaceutically acceptable emulsions with particle sizes typically below 1000 nm. The gaseous state at body temperature yields highly echogenic microbubbles, typically below 10,000 nm in diameter, which are effective as ultrasound contrast agents. Intravenous, intraarterial, oral, intraperitoneal, and intrauterine dosage forms, methods of administration, and imaging techniques are described.